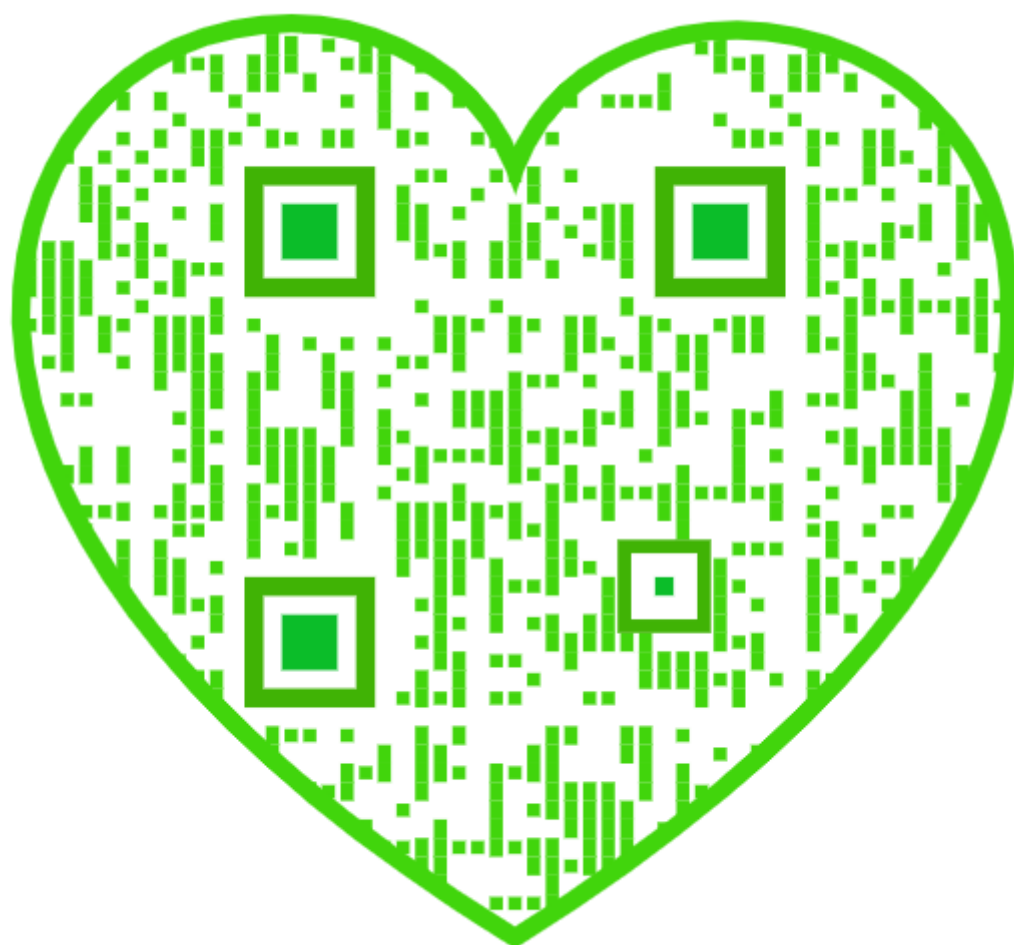


# Master in Artificial Intelligence



## Algorithm Selection & Development VI







# Purpose

**The purpose of the section is to help you learn how to research, select, and develop appropriate algorithms to become a Successful Artificial Intelligence (AI) Engineer**

**At the end of this lecture, you will learn the following**

- **How to does Adjusted Rand Index (ARI) and Adjusted Mutual Information (AMI) measure the agreement between true labels and cluster assignments**



# How to determine type of output and evaluation metrics?

## Understand the problem

Domain

Objectives

Constraints

## Define the problem as a

Supervised

Unsupervised

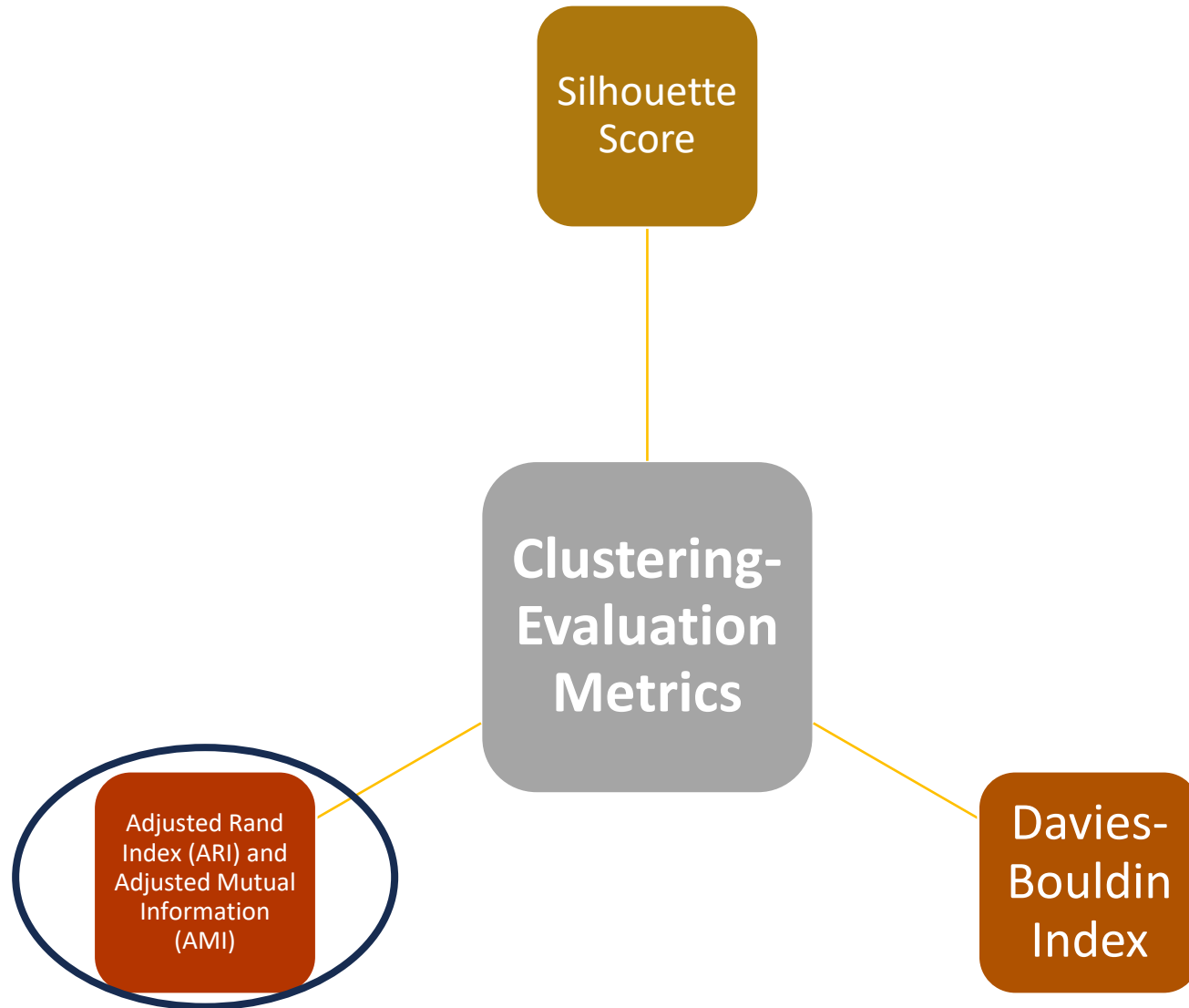
Reinforcement learning task

## Determine

type of output  
(e.g., classification,  
regression,  
clustering)

Evaluation metrics





# Adjusted Rand Index (ARI)

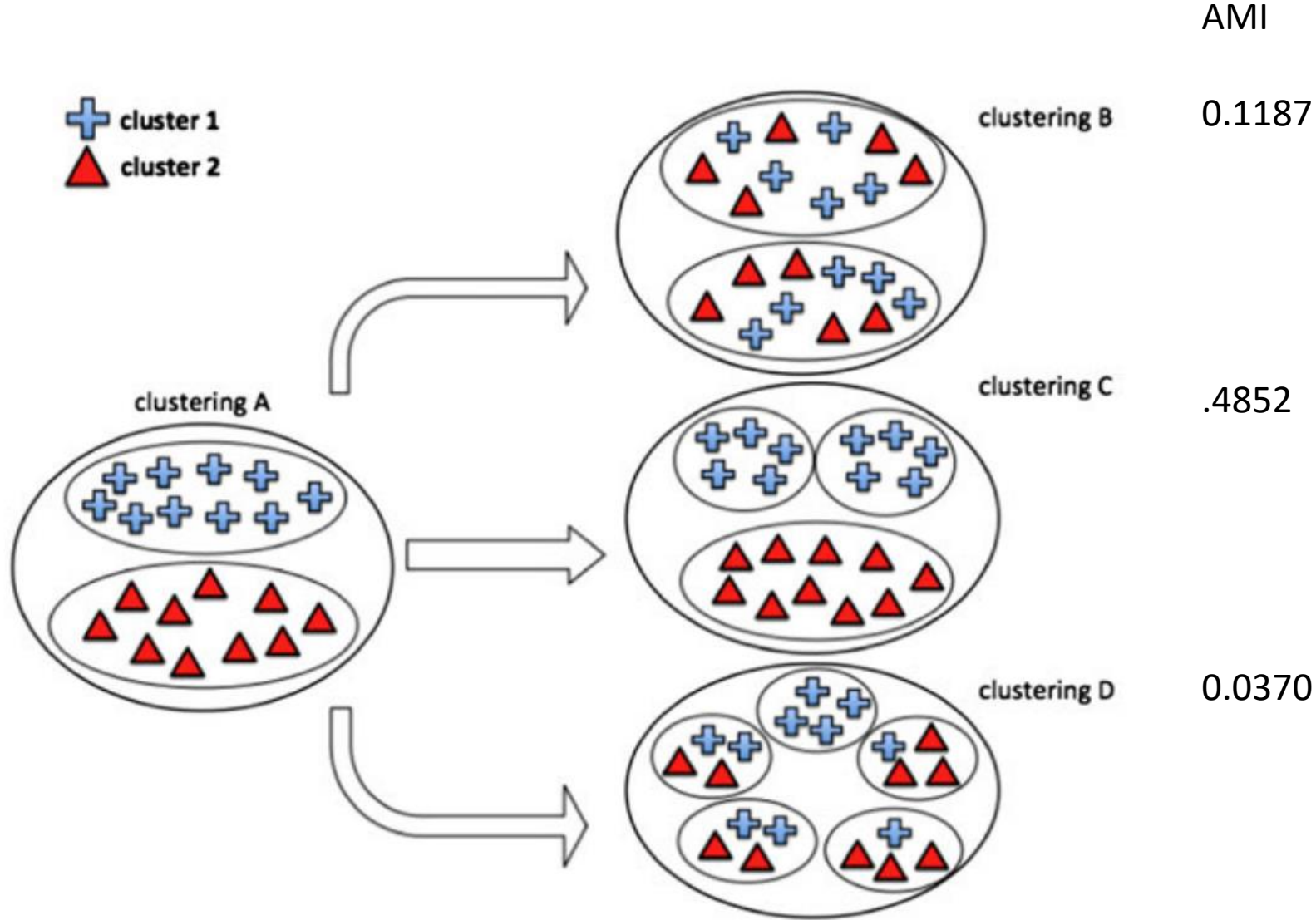


Example clusterings for a dataset with the [kMeans](#) (left) and [Mean shift](#) (right) algorithms. The calculated Adjusted Rand index for these two clusterings is  $ARI \sim 0.94$





# Adjusted Mutual Information (AMI)



# Interpreting ARI and AMI

Higher  
values

Better agreement, with 1  
representing perfect  
agreement and 0  
representing agreement  
equivalent to random chance

Negative  
values

Disagreement that is worse  
than random chance





# Using ARI and AMI for Cluster Evaluation



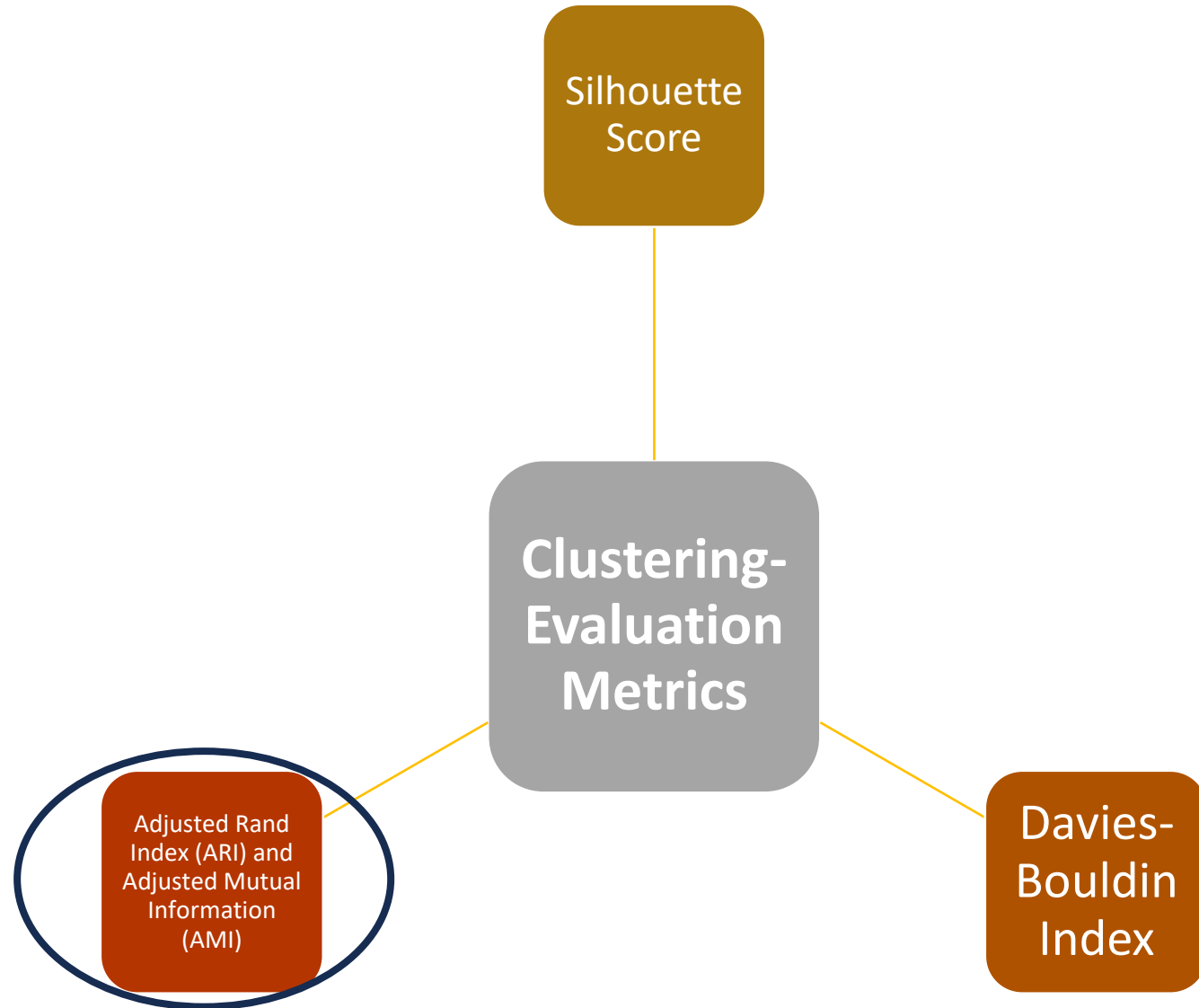
Commonly  
used

- Evaluate the performance of clustering algorithms
- Compare different clustering results

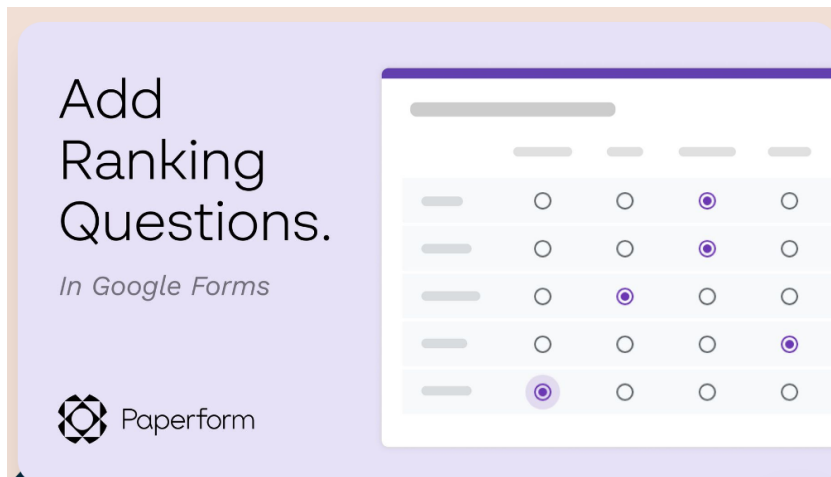
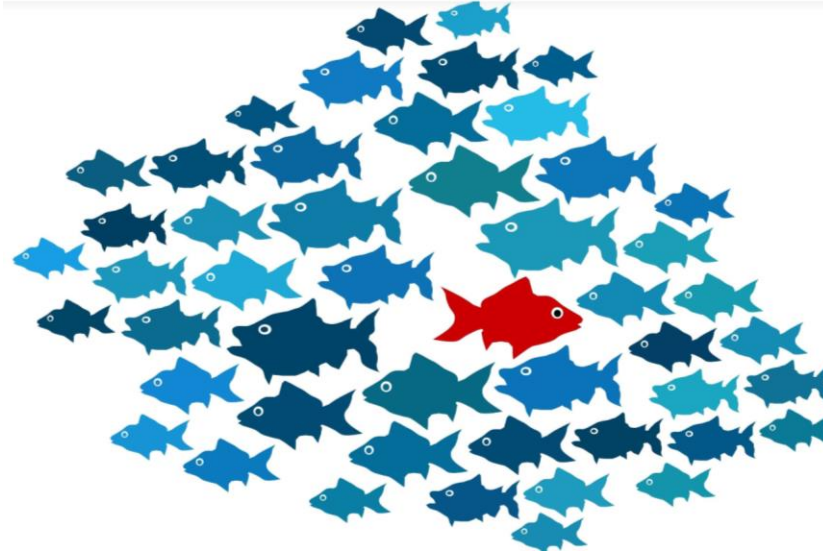
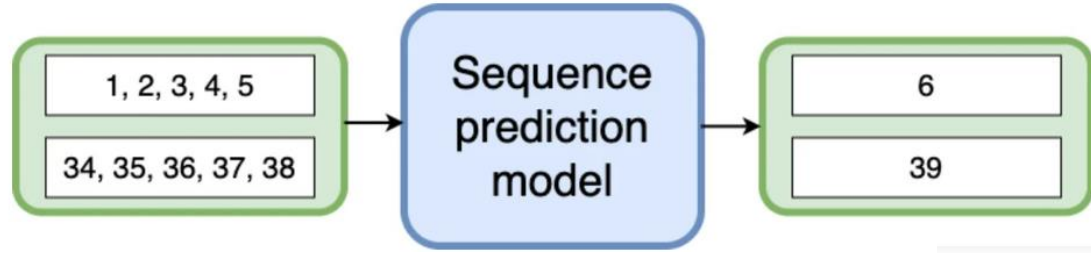
Provide  
insight

- Quality of the clusters produced by the algorithm
- Help assess the effectiveness of the clustering process



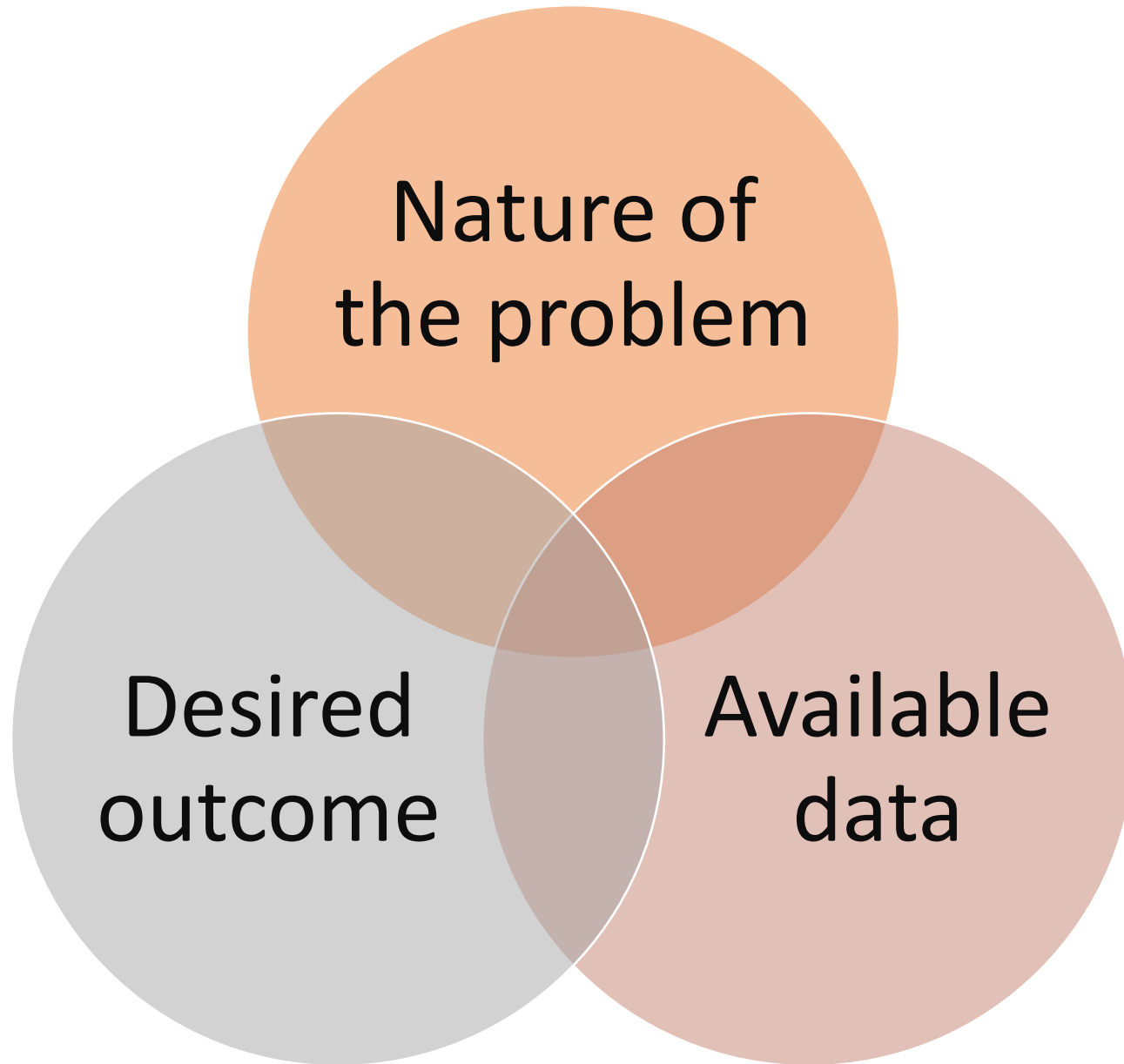


# Other Output Types





# How to determine type of output and evaluation metrics?



# What is next?

## Data Understanding and Preparation

Explore and analyze  
the available data to  
understand

- Characteristics
- Distributions
- Quality

Preprocess the data  
by handling

- Missing values
- Outliers
- Feature scaling

Split the data into

- Training
- Validation
- Testing sets for model evaluation





# Master in Artificial Intelligence



## Algorithm Selection & Development VI

